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AUTHOR Wilhelm, William Joseph
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ABSTRACT

A study determined specific skills and competencies that employers in Tempe, Arizona require in entry-level employees. It identified student-produced performance products applicants can use to signal proficiency in the skills and competencies. A modified Delphi inquiry was used, with 3 rounds of questionnaires over a 5-month period to survey 24 business and nonbusiness employment professionals. Quantitative and qualitative data gathered in each survey round were summarized and used to construct the next round's survey questionnaire. The Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) Report was the basis for rating the importance of entry-level workplace skills and competencies. The panel of experts generated performance product ideas that could signal proficiency in each SCANS skill and competency and rated and ranked the performance products on Likert-type scales measuring applicability and usefulness to hiring personnel. Findings were a rank ordering by importance to the organization of SCANS skills and competencies that showed human interactive skills and competencies as most critical, technological and resource management skills and competencies as least, and a list of performance products to signal proficiency in a skill or competency--traditional (application forms, transcripts, letters of recommendation, lists of extracurricular activities, resumes) and nontraditional products (written documents, videotaped presentations, electronic media documentation, portfolios, exhibitions). (30 references) (YLB)

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A DELPHI STUDY OF DESIRED ENTRY-LEVEL WORKPLACE SKILLS, COMPETENCIES, AND PROOF-OF-ACHIEVEMENT PRODUCTS

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By
William Joseph Wilhelm, Ed. D.

ED 430 093

Abstract

The purpose of this study was to determine the specific skills and competencies that area employers require in their entry-level employees and to identify specific student-produced performance *products* which applicants can use to signal proficiency in the respective skills and competencies. The study involved surveying a broad organizational and industrial cross section of Tempe, Arizona and vicinity employers. A modified Delphi technique of inquiry was used, employing three rounds of detailed questionnaires over a five month period surveying a panel of 24 hiring managers, human resources specialists, small business owners and cooperative occupational education specialists.

With each survey round, both quantitative and qualitative data were gathered. The data were summarized and used to construct the next round survey questionnaire. The Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) Report served as the basis for rating the importance of a variety of entry-level workplace skills and competencies. The panel of experts generated performance product ideas, which could signal proficiency in each of the SCANS skills and competencies. In subsequent rounds, the panel rated and ranked the performance products on Likert-type scales measuring applicability and usefulness to hiring personnel. Panelists' comments were encouraged at each round to clarify large rating and ranking score variances, define qualities and characteristics of performance product ideas and comment on other data generated by the panelists.

Findings include a rank ordering by importance to the organization of all of the SCANS skills and competencies. This ranking shows the human interactive skills and competencies as the most critical, the technological and resource management skills as the least critical. Findings also include a listing of performance product ideas to signal proficiency in a particular skill or competency. Performance product ideas include traditional products such as completed application forms, transcripts, letters of recommendation, lists of extra-curricular activities, resumes, etc. Non-traditional products include an array of written documents, videotaped presentations, electronic media documentation, portfolios and exhibitions.

Recommendations include making the findings available to area high schools for emphasis in their curricula, and studying a method in which the high school can assist the student in presenting the traditional performance product data in a single coherent and succinct instrument. Further research is recommended to define the specific qualities and characteristics of the non-traditional performance products identified by the panel as useful, and to identify methods by which these can be successfully targeted throughout a high school's curriculum and instruction.

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Introduction

Throughout America in recent years, business, labor, and educational leaders have been coming together to articulate educational goals that reflect this convergence. Many groups have undertaken the task of identifying the skills and competencies that are required of entry level workers (for example, the Future of the American Workforce Conference, 1994; National Council on Education Standards and Testing (NCEST), 1992; National Education Standards and Improvement Council, 1994; National Educational Goals Panel, 1992; National Skills Standards Board, 1994; New Standards Applied Learning Framework Project (Resnick & Wirt, 1996); and the Secretary's Commission on Achieving Necessary Skills (SCANS) 1991.

The identified skills and competencies are intended to afford entry-level workers personal and financial success in the workplace, and to become conscientious and contributing members of society. The SCANS (Secretary of Labor's Commission on Achieving Necessary Skills, 1991) skills and competencies have been accepted in general by both industry and education as reasonable, comprehensive, logical, and attainable (Resnick and Wirt, 1996). In the state of Arizona, for example, the Arizona Department of Education commissioned Standards Design Teams to specifically tailor skills and competencies to match the identified needs of the Arizona workplace. The SCANS report served as a basis for these studies, which culminated in the Arizona Workplace Skills Standards (Arizona Department of Education, March 1997). These identified skills and competencies serve as the target workplace skills and competencies criteria for the current Arizona Student Achievement Program (ASAP) which is intended to guide the curriculum throughout the state.

The SCANS recommendations call for high school graduates entering the workforce to be capable of demonstrating performance objectives (SCANS: What Work Requires Of Schools, 1991). For example, entry-level workers should be able to participate as a member of a team, communicate ideas to justify a position both orally and in writing, acquire and evaluate information, perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques, and demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings (SCANS 1991). All of the SCANS recommendations are written specifically to target *performance* goals.

In many high schools, however, learning is measured by primarily using standardized tests. The standardized test can, in fact, more easily assess the knowledge retention of students on a large scale because scores can be easily quantified and statistical analyses can be performed to derive findings about population groups. Standardized tests, however, cannot measure the actual performance capabilities of students (Berliner 1995, p. 318; Darling-Hammond, 1995, p. 2; Stiggins, 1997, p. 79; Wiggins, 1993, p. 15).

Statement of the Problem

In order to align high school outcomes with workplace demands, performance outcomes and performance assessments seem logical (Stiggins, p. 79-88). This study did not present arguments of performance assessment versus standardized assessment. It proceeded under the assumption that both have legitimate educational purposes. The study began with the performance criteria established in the SCANS Report, which served as a basis for launching this study.

The SCANS Report identified workplace skills and competencies on a *national* level. It did not accomplish this on the local level for each school district in America. Further, the SCANS reports did not establish performance assessments to measure individual proficiency in the identified skills and competencies. For educational practitioners at the local level, questions arise. Are the workforce skills and competencies desired by the local community different from the nationally identified skills and competencies? If so, how? What constitutes achievement of proficiency in each skill and competency? What assessments should be utilized to best measure proficiency? Who should make these determinations?

It seems obvious that the local community workplace would answer the question of whether the locally desired workplace skills and competencies are different from the national ones. The community workplace should also identify the differences, if any. It is not so obvious who should answer the questions regarding what constitutes achievement of proficiency and what assessments should be used. The employers have a stake in determining the correct answer to these questions by virtue of the fact that they will be hiring these workers and will expect performance proficiency. The educational community has a stake in answering these questions because they, inevitably, are held accountable for providing the proper instruction to ensure proficiency. It is the author's contention that this is an extremely critical area for communication between the education community and the employment community, an area where a major communications gap currently exists. It is precisely at this gap that both the education community and the employment community must again come together to answer the question, what constitutes achievement of proficiency and what assessments should be used?

In order for performance achievement standards to be valid in the workplace, the workplace must have input into their establishment. It follows, therefore, that the workplace should also have input into the types of performance assessments used to measure proficiency. These performance assessments must be of sufficient detail and complexity to afford the employer a viable means of understanding the level of achievement that each entry-level employee has reached. What can the student have in his/her possession after graduation that will signal the employer that he/she has proficiency in the skills and competencies that the employer requires? Are these performance products to be in the traditional form of diplomas and transcripts, or in the nontraditional form of portfolios, photographs, videos, projects, endorsements, essays, and certifications, or combinations of these?

Purpose of the study

Adhering to the philosophy that American schools are accountable to their communities, the purpose of the study was to determine the specific SCANS skills and competencies that the city of Tempe, Arizona and vicinity employers look for in their entry-level employees and to identify specific student-produced performance *products* which employers would use to evaluate applicants in their hiring processes. Encompassing a variety of different industries and company sizes that employ entry-level high school graduates, and based on the assumption that most high school graduates will accept initial employment within their home communities, the findings were intended to be generalized back to the local community and its high schools.

Closing the Skills Gap

The skills gap demonstrates the difference between the quantity and quality of a worker's skills and the demands of his particular job. There are two schools of thought concerning this skills gap: first, that the pool of workers is less qualified than in previous times, and second, that job requirements increase over time and with innovation, but that worker's abilities do not increase along with them. Both are likely to be true. According to research by the National Assessment of Educational Progress (NAEP), academic performance in the U.S. has not fallen off dramatically since 1969. Rather, the demands of the external competitive environment have increased (Stone, 1991; Eck, 1993; Szabo, 1993). Other surveys contend that the youth graduating from our high schools do not possess even the most basic of skills (SCANS, 1991; Steck, 1992; Packer, 1993; ACT, Inc., 1998). Efforts to remedy the skills gap situation, therefore, also vary depending upon the point of view. Those who adhere to the "jobs are changing faster" theory address training in the workplace. Those who espouse the "poor graduate skills" theory address education in the schools.

There are any number of strategies that schools are using to address the instruction and assessment of basic workplace skills. Also, based on the growth in the acceptance of performance-based assessment, there exists a growing body of literature and thought dealing with the manner in which high school graduates can signal employers that they do possess the basic skills that employers are looking for. Traditional diplomas and transcripts cannot convey the results of authentic performance assessments. Well-constructed performance-based assessments require a greater number of learner "thinking" and "action" steps than those responses required by typical multiple-choice standardized tests. These steps combine to produce a more complex and thorough *performance product,* which can provide a more useful insight into an individual's proficiency level with regard to targeted skills and competencies. Traditional products that graduates use in signaling their achievements to potential employers have been diplomas, transcripts, resumes, and letters of reference from teachers, coaches, or administrators. Many other products are being discussed in the education community today: basic skills certificates and certificates of mastery (Tucker, 1996; Berkson, 1998), portfolios (Wiggins, 1993; Sizer, 1984; Berliner, 1995; Darling-Hammond, Ancess & Falk, 1995; Stiggins, 1997), digital portfolios (Wiedmer, 1998), statewide achievement

exams (Elmore, 1996; ASAP, 1997), *Baccalaureate* degrees (Bishop, 1996), competency profiles (Bishop, 1996). Also, commercial proprietary methods have been introduced such as ACT, Inc.'s WorkKeys ™ and ETS's Worklinks, as well as governmental innovations such as Toronto's (Canada) Benchmarks, Michigan's electronically accessed portfolio system, and California's statewide portfolio system called the *Career-Tech Assessment Project.*

Study Procedures

This study employed a Delphi method of inquiry to generate data from a panel of twenty-four business and non-business employment professionals representing a broad range of industries and company sizes. According to Scheele (1975), a successful mix of respondents on a Delphi panel includes *stakeholders*, those who are or will be directly affected; *experts*, those who have an applicable specialty or relevant experience; and *facilitators*, those who have skills in clarifying, organizing, synthesizing, stimulating (p. 68). Stakeholders, in the context of this study, would be recent high school graduates. Because these individuals would have no first hand experience about employment requirements in the study area, they were not included in the panel makeup. Table 1 illustrates the characteristics of the panel of experts.

Table 1

Characteristics of Panel Members

Occupational Category	Organization Size	Gender	Number of Respondents
Retail General Merchandise	100+	F	1
Retail Apparel & Accessories	50+	F	1
Retail Grocery	50+	M	1
Retail Hardware Sales	10+	F	1
Automobile Dealership	50+	M	1
Full Service Restaurant Chain	100+	M	1
Quick Service Restaurant Chain	100+	F	1
Hotel/Resort	100+	F	1
Property Management	less than 10	M	1
Telecommunications	100+	F	1
Bank Credit Card Center	100+	M	1
Temporary Personnel Service	100+	M	1
Personnel Consulting	less than 10	M	2
Computer Distributor	100+	F	1
City Government	100+	M	1
Semiconductor Manufacturer	100+	F	2
Industrial Electronics Manufacturer	100+	F	1
Medical Devices Manufacturer	100+	M	1
Computer Component Manufacturer	100+	F	1
Electric Utility	100+	F	1
High School Educator	100+	F	1
Community College Educator	100+	F	1
			24

Development and Administration of the Delphi Questionnaires

In developing a list of entry-level workplace skills and competencies, the Secretary's Commission on Achieving Necessary Skills (SCANS) spent 12 months talking to business owners, public employers, managers, union officials and on the line workers in stores, offices, factories and government offices across the country. The findings of the commission were published in a series of publications beginning with What Work Requires of Schools: A SCANS Report for America 2000 (1991). Because it has wide acceptance in the business, labor, government, and education communities, it was used as the foundation for assessing the skills and competencies that employers in the study area wanted. In the present study, the Round One Questionnaire listed the complete definition of each skill and competency, one per page, as quoted directly from Skills and Tasks for Jobs: A SCANS Report for America 2000, (SCANS, 1992, pp. 2-5 -- 2-9). Following each skill and competency definition on each page was a five-point Likert scale for the respondent to complete the initial rating. The Likert scale was presented as follows: not critical = 1, somewhat critical = 2, moderately critical = 3, highly critical = 4, and extremely critical = 5. After rating each SCANS skill and competency, each panelist was asked to generate a list of proof-of-performance products that they do use, or could use, to evaluate proficiency for each skill and competency. A list of over 125 performance products ideas were furnished to the panelists to stimulate ideas regarding possibly useful performance products that they could or would employ in their hiring evaluation practices. Panelists were not limited to the products on the list, but were encouraged to think of others as well.

The Round Two Questionnaire was constructed using the results tabulated from the Round One Questionnaire. Each panel member could review his or her own rating responses from Round One in relation to the entire panels' responses, and provide a second rating. Following the Likert rating scale was a listing of all the performance product ideas generated in the first round by the panel members for each skill and competency. Panel members then rated the applicability of each performance product idea to their own institution using another Likert scale rating system as follows: not applicable = 1, somewhat applicable = 2, moderately applicable = 3, highly applicable = 4, extremely applicable = 5. The panel also ranked their top five choices from 5 to 1, with 5 being the most useful.

The Round Three Questionnaire was constructed using the results tabulated from the Round Two Questionnaire. Panel members were shown summaries of the previous round's ratings and rankings of both the individual SCANS skills and competencies and the proof-of-performance products. They then confirmed their final ratings of each SCANS competency and skill, and provided their final rating and ranking for each performance product idea generated.

Within the methodologies employed in the Delphi technique, there is not an established standard for measuring significance, per se. The quantitative methods used in each Delphi application would determine its measurements of significance. Quantitative measurements employed in this study are the measurements of central location. Specifically, the mean was chosen as the measurement for comparing rating scores to ranking scores because it has the property that, for most distributions, it is a more

accurate and efficient estimate of the population mean than other measures of central location. It is subject to less error (Ferguson & Takane, 1989).

In comparing the group mean score for each performance product rating to its respective ranking score, a value of 3.0 was assigned to the mean scores as the degree of significance. The rating score of 3.0 represented *moderate applicability* of a given performance product to a panel member's organizational hiring practices. Assignment of the value of 3.0 for the degree of significance is a decision made by the researcher after the initial consultations with each panel member. It was determined that, although a subjective judgment, moderate applicability would have to obtain for innovation to be chanced. This is to say, employment personnel responsible for hiring entry-level workers would not be likely to engage in the evaluation of performance products presented by applicants if those products were not, at least, moderately applicable to that organization's skill and competency requirements.

As depicted in the research graphic data, the mean rating scores for each performance product were plotted in descending order, highest to lowest, to obtain a depiction of the most applicable performance products for each SCANS skill and competency. See Figure 1 below, for an example of how the performance product data for each competency and skill were depicted. The mean ranking scores were plotted subordinate to the mean rating scores because all panelists rated each performance product, but not all panelists ranked each performance product. After rating each performance product, the panelists were asked to rank only the top 5 performance products in descending order of usefulness, 5 being the most useful. Turoff (Linstone & Turoff, 1975) discusses the importance of taking care to avoid confusing and "painful" tasks for panel members (p. 84-101) which involve rank ordering large numbers of variables in a specific set. In this study, up to 20 performance product ideas were generated for a single SCANS skill. Asking a panel member to rank order 20 items, many of which may not have received a high rating by the that panelist, would have risked producing disinterested ratings resulting in biased and invalid data.

Performance product mean ratings over the value of 3.0 accompanied by respective mean rankings over the value of 3.0 suggest the possibility of a relatively valid performance product. Standard deviations for the ratings and the rankings, as well as the frequency of ranking responses for each performance product were also displayed in an accompanying table to each graph. Although the correlation of the means above the value of 3.0 suggest significantly valid products, the ranking frequency responses and deviation values are a useful check. For example, where high mean ranking scores were shown in the data, but associated with low rating scores, the ranking response frequencies generally demonstrated that there were very few respondents who ranked the product.

The validity of the resulting judgment of an entire group in a Delphi inquiry is typically measured in terms of the explicit "degree of consensus" among the experts (Linstone & Turoff, 1975, p. 22). Linstone & Turoff (1975) state: "The guarantor of such systems has traditionally been the function of human agreement, i.e., an empirical generalization (or communication) is judged 'objective,' or 'true,' or 'factual' if there is 'sufficient widespread agreement' on it by a group of 'experts'" (p. 21). The degree of consensus is the measure of validity.

Figure 1. Example of performance product data summary from research study.

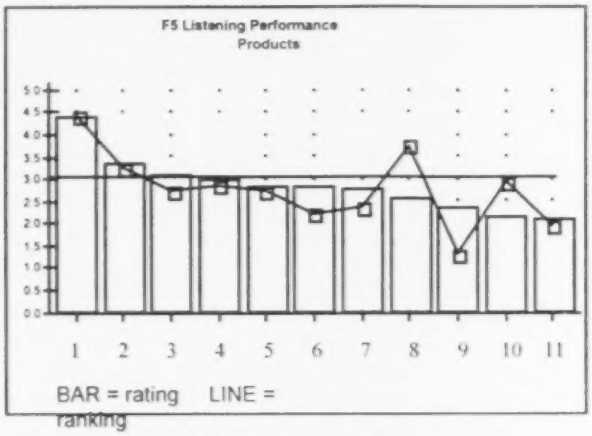

Figure 5/Table 10
Listening
Performance Products
by Rating and Ranking

RT Mean	RK Mean	RT SD	RK SD	RK *f*	Category F5 Listening	
4.429	4.429	1.028	1.028	21	1	Observation of applicant during interview
3.381	3.308	1.244	1.437	13	2	Summary multi-discipline senior year project
3.143	2.786	1.424	1.578	14	3	Role-play video - project, performance,
3.045	2.889	1.174	1.269	9	4	Standardized test results
2.864	2.750	0.941	1.138	12	5	Letters of recommendation
2.857	2.250	1.153	1.165	8	6	Report from school indicating competency
2.810	2.400	1.365	0.966	10	7	Evaluation/critique of newsworthy speech
2.632	3.750	1.212	0.957	4	8	Follow instructions on a VRU
2.381	1.333	1.161	0.577	3	9	Diploma
2.182	3.000	1.053	1.414	4	10	Dale Carnegie class
2.136	2.000	1.207	0.926	8	11	DECA membership

Figure 5/Table 10, Listening Performance Products by Rating and Ranking, above, introduces the importance of applicant performance in the interview, the event at which all panelists indicated they would evaluate listening proficiency. The summary multi-discipline senior year project is again valued highly by the panel; a third consistent high scoring of this performance product. Video documentation of a role-play project or performance is introduced as a viable alternative media. Standardized test scores again appear valid. Letters of recommendation appear valid, by virtue of the ranking response frequency of over half of the respondents (f=12).

RT = rating; RK = ranking; SD = standard deviation; f = frequency of responses; F5 Listening = skill identification

In this study, reliability was demonstrated by calculating a measure of *interjudge agreement*. According to Smith & Glass (1987):

> For those methods of measurement that require ratings, behavioral observations, or judgments of one individual by another, there are techniques for estimating the error associated with the observer. The procedure requires the same individual or event to be observed or rated by two or more judges. The ratings given by the judges are then correlated or the percentage of agreement calculated to provide a measure of interjudge reliability. The resultant statistics reflect the ability to generalize across potential judges or observers. A high value of the statistic indicates that the quantities assigned to the individuals are not limited by the personality and abilities of one judge (104-105).

The calculation of interjudge agreement was undertaken at the completion of the first round of the Delphi study. The expert panel had completed one rating of the skills and competencies. The degree of variance of their ratings around the mean would be highest at this first rating point in the study.* A calculation of all ratings that fell outside ± 1 standard deviation from the mean of each skill and competency showed a range of variation on each rated skill and competency from 0 to .38. The average overall degree of variation (disagreement) was .11969. This indicates that there was an overall interjudge reliability degree of agreement of .88 or 88%.

Findings

SCANS Skills and Competencies Ratings

Findings regarding the importance of the SCANS skills and competencies demonstrated that those skills dealing with human interactive abilities rated highest. Table 2, Ratings of SCANS Foundation Skills (F) and Competencies (C) Sorted by Mean Rating Value, shows that the panel believed Integrity/Honesty, Reading, Participating as Part of a Team, Responsibility, Works with Cultural Diversity, Serves Clients and Customers, Listening, Sociability, Speaking, Knowing How to Learn, Arithmetic, and Writing, rated in the upper third of all the skills and competencies in importance.

Skills and competencies that fell in the middle range of importance were, Self Management, Problem Solving, Allocates Time, Self-Esteem, Decision Making, Reasoning, and Creative Thinking, Uses Computers to Process Information, Mathematics, Interprets/Communicates Information, Acquires & Evaluates Information, Organizes/Maintains Information, and Exercises Leadership.

Although there was a significant degree of disagreement among panel members, overall, the comments reflected low demand for the remaining skills and competencies:

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* Helmer and Dalkey showed an interest in the observation that the variance of the responses around the median decreases with increasing number of rounds (Helmer, 1966). In the above calculation, the researcher chose the mean as the point of central measurement and a degree of variance equal to ± 1 standard deviation around the mean as the estimation of the degree of consensus as inferred by Scheibe, Skutsch and Schofer (1975, p. 276).

Negotiates to Arrive at a Decision, Understands Systems, Teaches Others, Improves or Designs Systems, Selects Technology, Applies Technology to Tasks, Allocates Human Resources, Monitors/Corrects Performance, Allocates Money, Seeing In the Mind's-Eye, Maintains/Troubleshoots Equipment, and Allocates Materials & Facilities.

Table 2

Ratings of SCANS Foundation Skills (F)and Competencies (C) Sorted by Mean Rating Value

Code	Skill / Competency	Mean	Std dev
F17	Integrity/Honesty	4.850	0.366
F1	Reading	4.750	0.444
C9	Participates a Part of a Team	4.700	0.470
F13	Responsibility	4.650	0.489
C14	Works with Cultural Diversity	4.650	0.671
C11	Serves Clients & Customers	4.600	0.598
F5	Listening	4.550	0.510
F15	Sociability	4.158	0.688
F6	Speaking	4.150	0.671
F11	Knowing How to Learn	4.100	0.718
F3	Arithmetic	4.000	0.725
F2	Writing	3.950	0.605
F16	Self Management	3.947	1.026
F9	Problem Solving	3.900	0.718
C1	Allocates Time	3.850	0.745
F14	Self-Esteem	3.750	0.910
F8	Decision Making	3.650	0.587
F12	Reasoning	3.600	0.883
F7	Creative Thinking	3.550	0.826
C8	Uses Computers to Process Information	3.450	0.999
F4	Mathematics	3.300	0.865
C7	Interprets/Communicates Information	3.300	0.571
C5	Acquires & Evaluates Information	3.150	0.447
C6	Organizes/Maintains Information	3.150	0.489
C12	Exercises Leadership	3.050	0.686
C13	Negotiates to Arrive at a Decision	3.050	0.686
C15	Understands Systems	3.050	0.686
C10	Teaches Others	2.950	0.999
C17	Improves or Designs Systems	2.450	1.191
C18	Selects Technology	2.400	0.883
C19	Applies Technology to Tasks	2.400	0.995
C4	Allocates Human Resources	2.300	0.979
C16	Monitors/Corrects Performance	2.300	0.979
C2	Allocates Money	2.263	0.933
F10	Seeing-Mind's Eye	2.250	0.851
C20	Maintains/Troubleshoots Equipment	2.200	0.951
C3	Allocates Materials & Facilities	2.100	0.718

n=20, missing 4 (from total of 24 panelists), maximum mean rating = 5

In a similar study conducted with a panel of small businesses throughout the state of Oklahoma, very similar results were found (Harris, 1996). In that study, using similar rating methods, 9 out of the top 12 skills and competencies found in the present study were also found. Integrity/Honesty topped the list in both studies. Among the lowest rated 12 skills and competencies in the present study, fully 8 of the same skills and competencies were found in both studies.

Proof-of-Performance Product Ratings and Rankings

This study identified many proof-of-performance product ideas. The panel generated a list of traditional and nontraditional proof-of-performance products for each of the 37 SCANS skills and competencies. Those performance products that employers traditionally use to evaluate entry-level job applicants were listed and discussed in some detail. For example, employer testing, letters of recommendation, past employer evaluations, references, resumes, and transcripts were mentioned frequently. The traditional interview process itself is also a critical event at which employment personnel assess the skill and competency levels of prospective employees. Many of the panelists said they focus on non-tangible products which applicants demonstrate during an interview through conversation, verbal responses to specific questions, gestures, and body language.

A number of nontraditional performance product ideas were also generated in the study. Several panel members suggested the use of various media to document student proficiency in selected skill areas. For example, video taped documentation was suggested for demonstrating proficiency in many areas including listening, speaking, creative thinking, reasoning, and self management, among others. The use of electronic media, computer diskettes, and the construction of internet web pages was suggested for use in demonstrating proficiency in the areas of creative thinking, organizing and maintaining information, interpreting and communicating information, and processing information. A comprehensive senior year research project received high ratings from the panel. The senior project, described much like an exhibition for graduation promoted by the Coalition of Essential Schools (Sizer, 1992), is intended to demonstrate proficiency in higher order thinking across a majority of the SCANS skills and competencies in a single comprehensive project. Letters, essays and calculations were suggested for certain skills and competencies. Standardized test scores, not a traditional employer tool for measuring applicant proficiency, were suggested several times to assess basic skills. Also, there were several product ideas suggested that fall outside the parameters of the traditional high school curriculum, such as scouting awards and Dale Carnegie courses.

Conclusions

- The highest valued skills and competencies by employers require an employee to interact with, and relate well with others in the workplace. These skills and competencies were, in order of their respective mean rating scores, Integrity/Honesty, Reading, Participating as Part of a Team, Responsibility, Works with Cultural Diversity, Serves Clients and Customers, and Listening.

- Somewhat contrary to much educational discourse today, the least important skills and competencies were those calling for knowledge of technology and resource management. Based on panelists' comments and ratings of these skills and competencies as non-critical, it can be concluded that these would be less important in employers' assessment procedures of entry-level workers. These skills and competencies are Improves or Designs Systems, Selects Technology, Applies Technology to Tasks, Allocates Human Resources, Monitors and Corrects Performance, Allocates Money, Sees Things in the Mind's Eye, Maintains and Troubleshoots Equipment, and Allocates Materials and Facility Resources.

- Traditional proof-of-performance products will continue to be used by hiring personnel. These include neat and complete applications, employer testing and interviewing, resumes, transcripts, references, letters of recommendation, and lists of certifications, awards and honors.

- Non-traditional proof-of-performance products directly demonstrating higher-order skills within the performance product itself include a variety of written documents, videotaped activities, and electronic (computer-related) media. These include the use of exhibitions, documented research, electronic portfolios, written essays, self reflected analyses and published articles, role-plays and speeches, marketing or business plans, brochures, pamphlets and newsletters, goal setting and personal improvement plans, work flow evaluations, cause and effect sequences, group decision-making documentation, attendance and tardy reports, grade level progression and on-time graduation, personal budgets and savings plans.

- Based on the comparative ratings and rankings of the performance product ideas generated by the panel members, both traditional and nontraditional types of performance products are worthwhile and should be constructed by students while still in school. More study is needed in the area of the nontraditional performance products to further define the specific qualities and characteristics of these products that directly demonstrate higher-order skills and signal performance proficiency to employers.

Recommendations

- Based on the conclusions regarding the importance of the respective SCANS skills and competencies, area high schools should implement strategies for augmenting the curriculum and instruction to teach these specific skills and competencies in the classrooms. Given the non-technical nature of the highest rated skills and competencies dealing with human interaction, they should be reinforced throughout all of the disciplines, wherever possible.

- Within the parameters of the Family Educational Right to Privacy Act (Buckley Amendment), area high school administrators, teachers and students should study methods in which they can develop a single instrument that adequately and succinctly provides prospective employers all of the traditional performance data identified in this research. These data include standardized and other relevant test scores, attendance records, transcripts, achievements and awards, clubs and extra-curricular activities, and references, testimonials or letters of recommendation from administrators, teachers, and coaches.

- It is recommended that further research of the nontraditional proof-of-performance product ideas generated by this study be carried out. Specifically, this research should further define the qualities and characteristics of the nontraditional proof-of-performance products rated highest for signaling proficiency in each respective SCANS skill and competency.

- Following the research suggested above, a pilot program/research study in an area high school, or school-within-a-school, should be established to specifically target the curriculum and instruction to fully implement the recommendations of the research. This program should include a longitudinal cohort study to follow workers who graduated from the program throughout several years of employment after graduation.

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